

PATENT SPECIFICATION

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(54) IMPROVEMENTS IN OR RELATING TO DEVICES FOR CLEANING TANKS OR SWIMMING POOLS

(71) I, SERGE ACCATINO, a French citizen residing at 2, Place de l'Eglise—La Tronche 38, France, do hereby declare the invention, for which I pray that a patent may be granted to me, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention relates to a device for cleaning a tank or swimming pool.

It relates in particular to the cleaning of tanks containing liquid and to the cleaning of a swimming pool containing water. Hereafter, a cleaning operation of the latter kind will be considered, it being understood that this application is not limiting.

The cleaning of a swimming pool consists in removing from the walls and the bottom of the pool the impurities, for example leaves, which are deposited there, such that these impurities are mixed with the body of the water in the pool and may be recovered on the filter with which the pump system of the pool is generally provided.

Known devices for carrying out this cleaning comprise a pump located on the ground and which is connected by a pipe to a moving body located in the pool and able to circulate in the pool the water under pressure which it receives from the pump.

This moving body is, for example, a flexible pipe free in the pool, as described in U.S. Patent Specification No. 3,074,078 or a number of flexible pipes capable of moving in a certain way in the pool such as the devices disclosed in U.S. Patent Specifications Nos. 3,032,044 and 3,139,099, or even an arrangement of flexible pipes attached to a float designed to move about at random in the pool such as the device disclosed in U.S. Patent Specification No. 3,291,145.

These devices have the disadvantage of having reduced efficiency in the case of a single flexible pipe or of being expensive to manufacture in the case of the other de-

vices. In addition, they necessitate a bulky pump installation due to the necessity of installing pipes between the pool filter and the cleaning device.

It is an object of the present invention to provide an efficient cleaning device with a much lower cost price which does away with the pipe system.

According to the invention a device for cleaning a tank containing liquid or a swimming pool containing liquid comprises a pump for supplying a movable body with liquid to be discharged under pressure from the movable body into the tank or pool, the pump being part of the movable body, and the movable body being adapted either to float in the liquid in the tank or pool or rise through the liquid in the tank or pool under effect of force of reaction due to the discharge of liquid by the pump.

By the word "pump", there is to be understood the pump itself and the motor which operates it.

This motor is preferably an electric motor but it is possible to use another type of motor, for example pneumatic or hydraulic.

It is preferred to arrange cycles of operation and stoppage of the pump so as to cause a displacement of the movable body in the pool.

Preferably, these cycles of operation and stoppage are controlled by a programmer which is connected to the motor of the pump by a control lead, for example an electric lead.

There will now be described hereafter, by way of example, two embodiments of the cleaning device according to the invention in one of which the movable body is a body with positive buoyancy adapted to move horizontally while in the other the body is of such buoyancy as to be submersible and adapted to move vertically and horizontally.

In the drawings:—

Fig. 1 is a diagrammatic view showing a first embodiment of the cleaning device

[Price 25p]

- with a floating movable body in use in a pool;
- Fig. 2 is a diagrammatic view of a device with a submersible movable body;
- 5 Fig. 3 is a horizontal section of the movable body of Fig. 2;
- Fig. 4 is a view of the bottom of the movable body of Fig. 2 and,
- 10 Fig. 5 is a view showing the operation of the movable body of Fig. 2.
- The device shown in Fig. 1 comprises a programmer 1 located outside the pool and connected by an electric lead 2 mounted on floats 3 to a movable body located in the
- 15 pool and referred to by the general reference M.
- This movable body comprises a float 4 and an immersed pump 5 fixed to a common mounting structure 6.
- 20 This structure 6 is in itself unimportant and may, for example, be constituted by the casing of the pump. Similarly, the nature of the float 4 is also unimportant.
- The pump 5 may suck in water directly
- 25 from the pool and deliver this water to a delivery outlet 7 to which is connected a semi-rigid pipe 9 which, by means of a distributor, is connected to small, flexible pipes 8 of different sections and lengths.
- 30 The programmer 1, supplied with electric current by a lead 10, sets up the cycles of operation and stoppage of the pump 5 according to the desired programme depending for example on the shape and the depth
- 35 of the pool.
- The pump 5 which receives current from the programmer 1 by means of the lead 2 is put under pressure and delivers the water through the flexible pipes 8.
- 40 Under the action of water pressure, the flexible pipes 8 effect alternating movements, rub against the bottom and the walls of the pool, thus loosening the impurities which are deposited on them.
- 45 These impurities are mixed with the water in the pool which enables the normal pump of the pool filter to recover and remove them.
- 50 Stoppage of the pump 5 allows the flexible pipes 8 to become unstressed and to disengage themselves from the walls and the corners of the pool in the event that they have been trapped there.
- 55 Re-starting of the pump, due to the pressure changes in the flexible pipes 8, causes a movement of the body M by propulsion of the float 4 at the surface of the pool.
- Repeated movements due to re-starting
- 60 of the pump thus allow the float 4 of the movable body M to travel over the entire surface of the water.
- Figures 2 to 5 relate to a variation of the device in which the movable body M, instead of being maintained adjacent to the
- 65 surface of the pool by the float 4, is de-
- signed to be able to rise and sink in the water of the pool.
- This movable body comprises, in its upper part, a float 11 and, in its lower part, stabilizing fins 12. It comprises between the float 11 and the fins 12 a pump 13 inside a casing 14 provided with a peripheral brush 15 and with lateral suction apertures 16 connected to the suction zone of the pump 13.
- The movable body comprises a delivery aperture 18 directed downwards and to which is conducted, by means of inclined surfaces 19, the water egressing from the delivery outlet 17 of the pump.
- A grid 20 located downstream of the suction apertures 16 and upstream of the pump 13 in the direction of suction of the water retains the impurities which penetrate with the water through the apertures 16 and these impurities are trapped in an intermediate chamber of the movable body M.
- The float 11 is designed so that the submersible body thus provided sinks slowly; the casing 14 can be removed in order to allow cleaning of the impurities recovered in the body. An adjustable rudder may possibly be incorporated in the movable body M in order to guide it depending on the shape of the pool.
- When the pump 13 is operated, the surrounding water is sucked in through the apertures 16 located in the upper part of the casing 14 and is delivered under pressure in a downwards direction through the aperture 18: the effect of this water pressure is to stir up the impurities deposited on the bottom of the pool and to mix them with the body of the water.
- Moreover, it causes the submersible body
- 105 to rise to the surface due to force of reaction; the fins 12 of the submersible body prevent it from rotating about its own axis under the effect of the rotary movement of the electric motor for the pump 13.
- When the pump 13 is stopped, the submersible body whose specific weight is greater than that of water, sinks slowly to
- 110 the bottom of the pool.
- Fig. 5 shows the submersible body M at
- 115 the beginning and at the end of the rising movement.
- During its successive rising and sinking movements, the device moves throughout the volume of the water. In addition, the
- 120 peripheral brush with which it is provided, which is circular or in sections, rubs against the vertical walls of the pool, thus removing all the impurities.
- A further embodiment of the invention
- 125 comprises the two movable bodies which have been described so combined as to constitute a submersible movable body comprising two pumps, one arranged like the pump of the device of Figs. 2 to 5 and the
- 130

other with its delivery aperture communicating with several flexible pipes (Fig. 1).

It should be noted that a submersible device according to the invention and as illustrated in Figs. 2 to 5 may be used in a swimming pool without a filter; it is thus sufficient to operate the pump continuously, the filter of the body acting as a filter for the pool.

10 The devices which have been described in their application to the cleaning of a pool by the sucking-in of water from the pool and the subsequent expulsion of this water, may naturally serve for cleaning any tank with an appropriate liquid which may be the liquid of the tank or which may be a liquid introduced into the tank which was previously empty of its normal contents, the tank being, or not being, a tank for liquid.

15 This appropriate liquid, generally water, may, depending on each case, be a particular cleaning solution, for example, a rust-removing solution, the efficiency of which is increased or accelerated by the liquid being circulated by the pump of the movable body.

WHAT I CLAIM IS:—

30 1. A device for cleaning a tank containing liquid or a swimming pool containing liquid, comprising a pump for supplying a movable body with liquid to be discharged under pressure from the movable body into the tank or pool, the pump being part of the movable body, and the movable body being adapted either to float in the liquid in the tank or pool or rise through the liquid in the tank or pool under effect of force of reaction due to the discharge of liquid by the pump.

40 2. A device according to claim 1, comprising a programmer for controlling the operating cycles of the pump.

3. A device according to claim 2, in which the programmer is adapted to be located outside of the tank or pool, and is connected to the movable body by an electric lead.

4. A device according to any one of claims 1 to 3, in which the movable body comprises floating means such that the body is of such buoyancy as to be submersible in the liquid in the tank or pool.

5. A device according to claim 4, in which there is around the pump a casing open laterally for the inlet of the liquid and its suction by the pump.

6. A device according to claim 4 or 5, comprising a filter upstream of the pump and a retaining chamber for the impurities trapped by the filter.

7. A device according to claim 5 or 6, in which the casing is open at its bottom for the outlet of liquid delivered by the pump.

8. A device according to any one of claims 4 to 7, in which the movable body comprises a peripheral brush for cleaning the walls of the tank.

9. A device according to any one of claims 4 to 8, comprising a second pump and one or more flexible pipes through which liquid is delivered by the pump.

10. A device according to any one of claims 1 to 3, in which the movable body has floating means such that it has positive buoyancy in liquid in the tank.

11. A device according to claim 10, in which the movable body comprises one or more flexible pipes through which liquid delivered by the pump is expelled.

12. A device for cleaning a tank or swimming pool substantially as hereinbefore described with reference to Fig. 1 or Figs. 2 to 5 of the accompanying drawings.

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Sheet 1

Fig.1

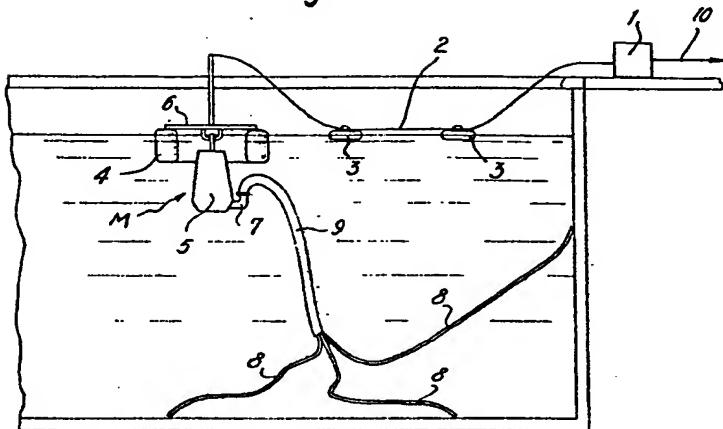


Fig.2

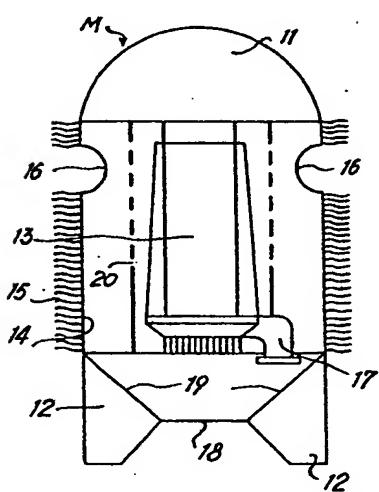


Fig.3

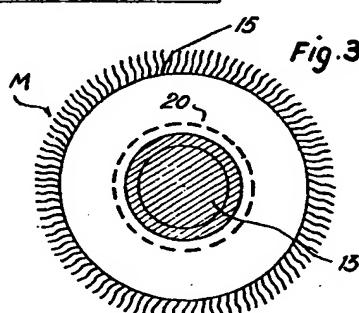
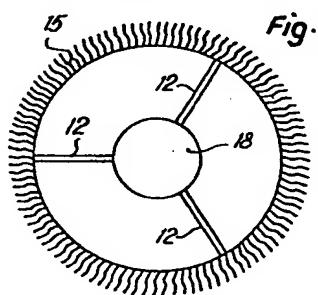


Fig.4.

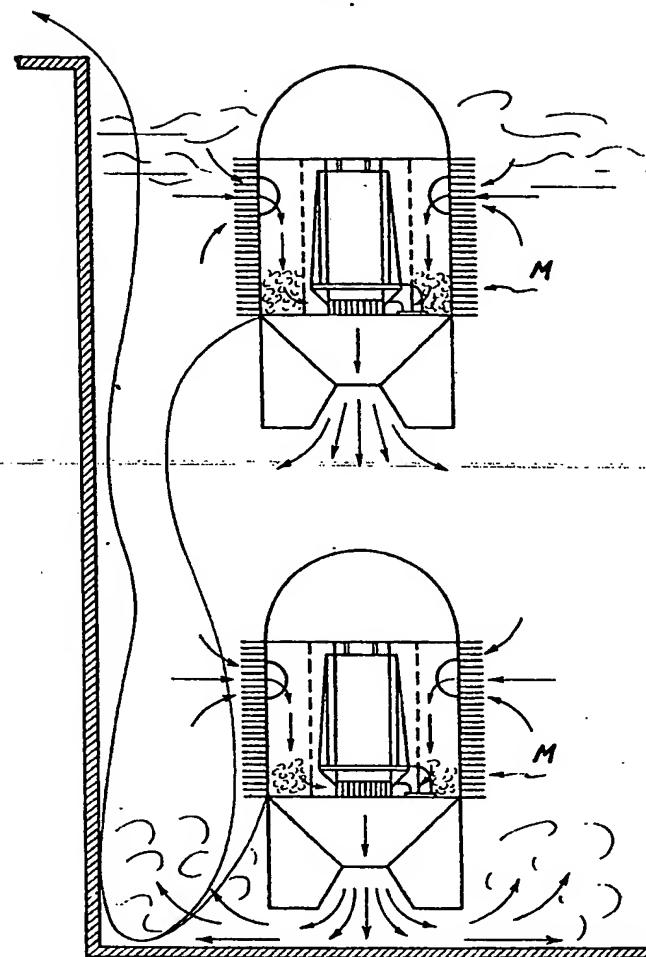


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Sheet 2

Fig. 5



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